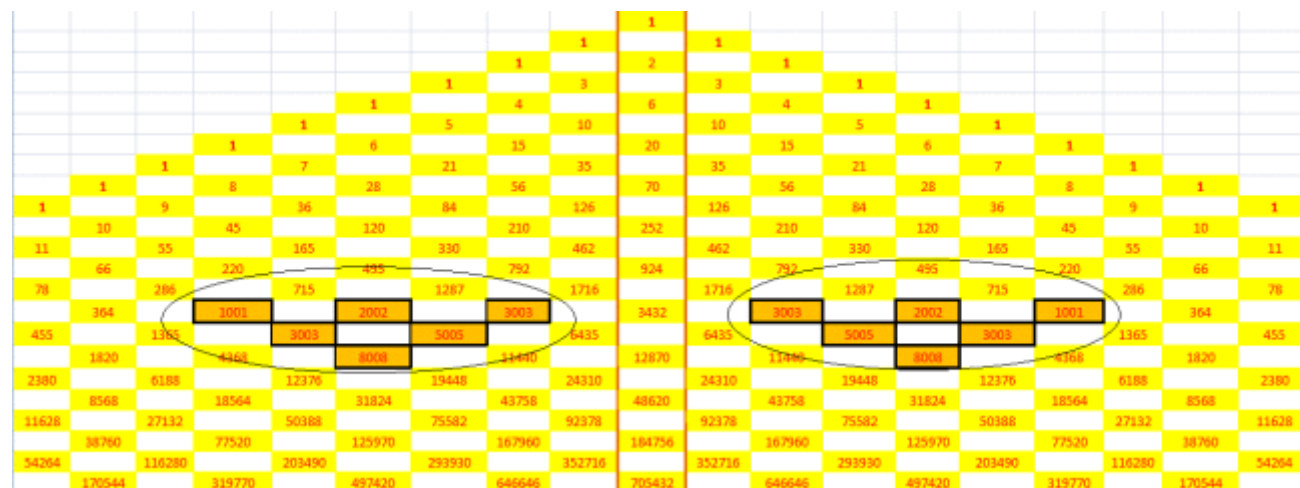


BERNARDBEDUYA

A Pascal's Triangle Hidden Inside the Pascal's Triangle

Posted on ~~February 6, 2016~~ July 5, 2016 by beduya22

It started with me noticing this pattern of 4-digit palindromic numbers starting on the 15th row of the normal Pascal's triangle:



Zooming in, I noticed that the palindromic numbers in the Pascal's triangle (i.e. 1001, 2002, 3003, 3003, 5005 and 8008) form an inverted triangle of some sort. What's more intriguing is that they are missing the other 4-digit palindromic numbers in the series which are 4004, 6006, 7007 and 9009.

55		165		330		462		462		330		165		55
	220		495		792		924		792		495		220	
286		715		1287		1716		1716		1287		715		286
	1001		2002		3003		3432		3003		2002		1001	
1365		3003		5005		6435		6435		5005		3003		1365
	4368		8008		11440		12870		11440		8008		4368	
6188		12376		19448		24310		24310		19448		12376		6188

I started making several assumptions until I entertained the idea that the said missing palindromic numbers are hidden inside the empty boxes adjacent to the existing ones in the Pascal's triangle. I also thought that the palindromic numbers are somehow keys to look for the missing ones. I began to research about 4-digit palindromic numbers until I came about this via

[https://en.wikipedia.org/wiki/1001_\(number\)](https://en.wikipedia.org/wiki/1001_(number)) ([https://en.wikipedia.org/wiki/1001_\(number\)](https://en.wikipedia.org/wiki/1001_(number)))

“One thousand and one is a sphenic number (https://en.wikipedia.org/wiki/Sphenic_number), a pentagonal number (https://en.wikipedia.org/wiki/Pentagonal_number), a pentatope number (https://en.wikipedia.org/wiki/Pentatope_number) and the first four-digit palindromic number (https://en.wikipedia.org/wiki/Palindromic_number).”

It was through this that I surmised that the significance of this number must mean something to the Pascal's triangle and that if I will use 1001 as the border of my theorized hidden Pascal's triangle, I might be able to find the missing 4004, 6006, 7007 and 9009. Thus, with a little bit of filling in the blanks, I came up with this:

1		13		78		286		715	1001	1287		1716		1716		1287		715
	14		91		364		1001	1001	2002	1001	3003		3432		3003		2002	
15		105		455		1365	1001	3003	2002	5005	1001	6435		6435		5005		3003
	120		560		1820	1001	4368	3003	8008	3003	11440	1001	12870		11440		8008	
136		680		2380	1001	6188	4004	12376	6006	19448	4004	24310	1001	24310		19448		12376
	816		3060	1001	8568	5005	18564	10010	31824	10010	43758	5005	48620	1001	43758		31824	
969		3876	1001	11628	6006	27132	15015	50388	20020	75582	15015	92378	6006	92378	1001	75582		50388
	4845	1001	15504	7007	38760	21021	77520	35035	125970	35035	167960	21021	184756	7007	167960	1001	125970	
5985	1001	20349	8008	54264	28028	116280	56056	203490	70070	293930	56056	352716	28028	352716	8008	293930	1001	203490
1001	26334	9009	74613	36036	170544	84084	319770	126126	497420	126126	646646	84084	705432	36036	646646	9009	497420	1001
33649	10010	100947	45045	245157	120120	490314	210210	817190	252252	1144066	210210	1352078	120120	1352078	45045	1144066	10010	817190
11011	134596	55055	346104	165165	735471	330330	1307504	462462	1961256	462462	2496144	330330	2704156	165165	2496144	55055	1961256	11011

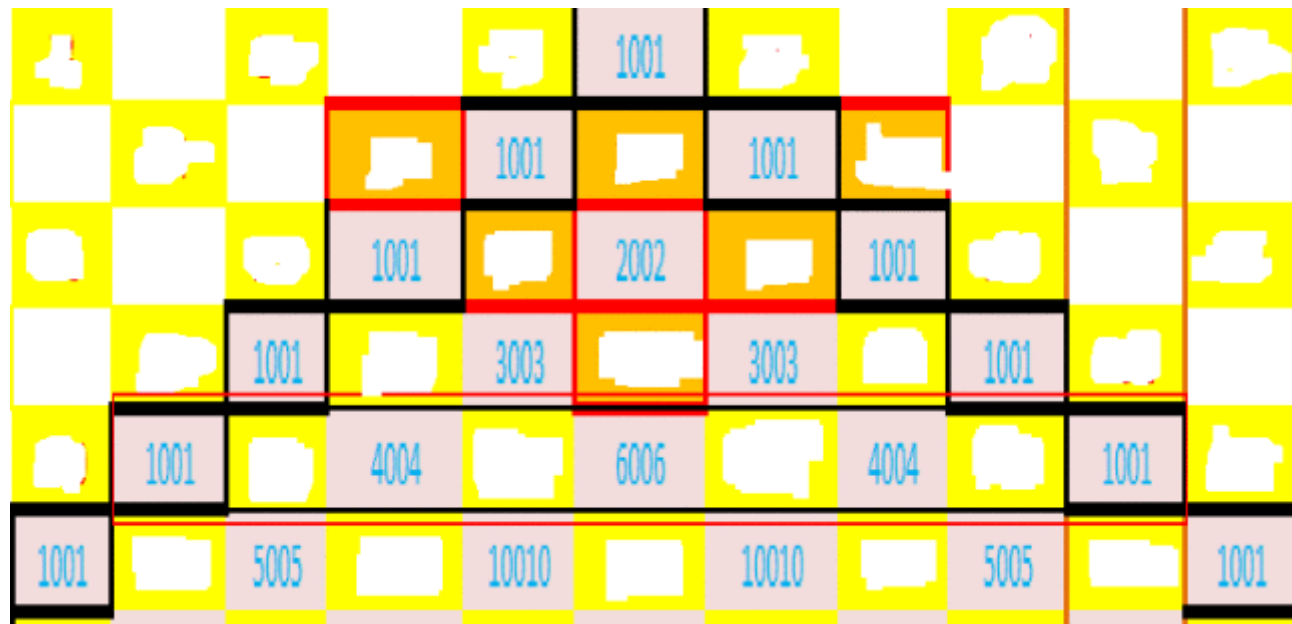
A blown up version below will, hopefully, help me explain my theory: Notice that the yellow boxes (plus the brown boxes shaped like an inverted triangle) are part of the normal Pascal triangle while the blue-colored numbers in fuschia-colored boxes are my theorized hidden palindromic Pascal's triangle. Unlike the normal Pascal's triangle which has the number 1 surrounding its edges, my own hidden palindromic triangle has 1001 as its borders. But like the normal Pascal's triangle, my version also follows the original rule of adding the two numbers on top to get the value of the one below them.

13		78		286		715	1001	1287		1716		1716	
	91		364		1001	1001	2002	1001	3003		3432		3003
105		455		1365	1001	3003	2002	5005	1001	6435		6435	
	560		1820	1001	4368	3003	8008	3003	11440	1001	12870		11440
680		2380	1001	6188	4004	12376	6006	19448	4004	24310	1001	24310	
	3060	1001	8568	5005	18564	10010	31824	10010	43758	5005	48620	1001	43758
3876	1001	11628	6006	27132	15015	50388	20020	75582	15015	92378	6006	92378	1001
1001	15504	7007	38760	21021	77520	35035	125970	35035	167960	21021	184756	7007	167960
20349	8008	54264	28028	116280	56056	203490	70070	293930	56056	352716	28028	352716	8008

And going to back to the missing 4-digit palindromic numbers, I was amazed to find them in this hidden palindromic Pascal's triangle as shown below:

	13		78		286		715	1001	1287
14		91		364		1001	1001	2002	1001
	105		455		1365	1001	3003	2002	5005
120		560		1820	1001	4368	3003	8008	3003
	680		2380	1001	6188	4004	12376	6006	19448
816		3060	1001	8568	5005	18564	10010	31824	10010
	3876	1001	11628	6006	27132	15015	50388	20020	75582
4845	1001	15504	7007	38760	21021	77520	35035	125970	35035
1001	20349	8008	54264	28028	116280	56056	203490	70070	293930
26334	9009	74613	36036	170544	84084	319770	126126	497420	126126
10010	100947	45045	245157	120120	490314	210210	817190	252252	1144066

Aside from this, I also noticed that, as in the normal Pascal's triangle, the 1st 5 rows of numbers are palindromic when they are connected as shown below:



1001

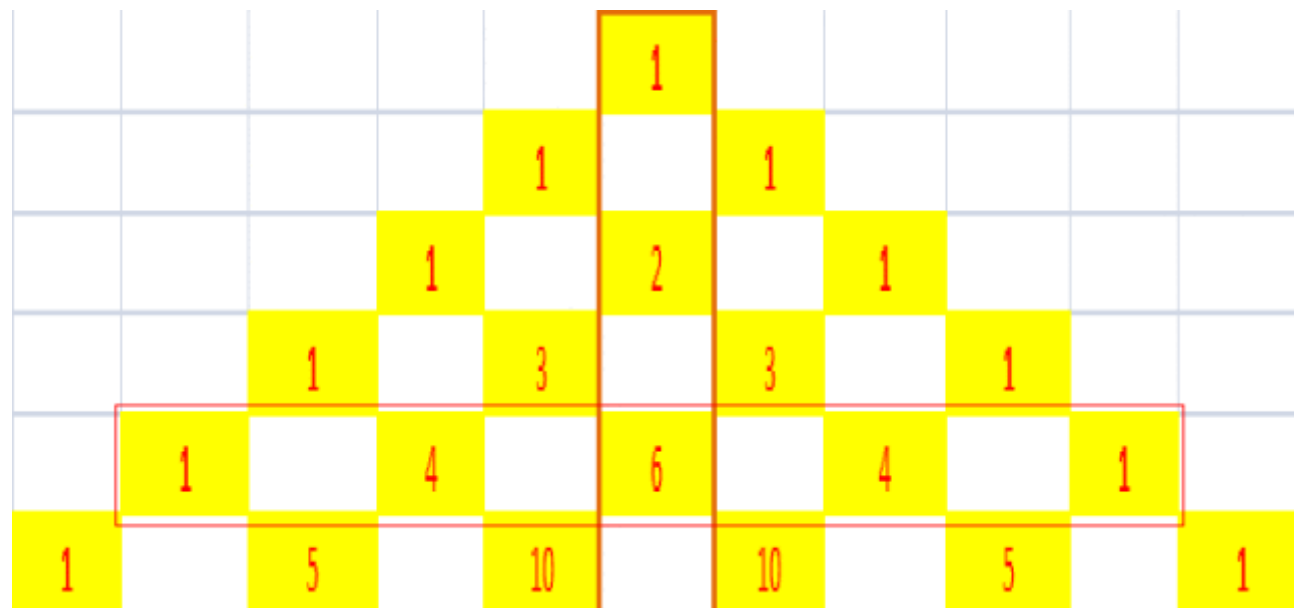
1001 1001

1001 2002 1001

1001 3003 3003 1001

1001 4004 6006 4004 1001

I, intentionally, erased the normal Pascal triangle's numbers above to emphasize my hidden Pascal's triangle. Let's compare this with the normal Pascal's triangle below:



Originally I thought that from the 6th row downwards, the numbers are no longer palindromic. I was very glad that someone from mathisfun.com corrected me by saying that the sixth row down to infinity are still palindromic once you use higher base (i.e. Base 11, etc.) digits with numbers greater than 9. Thus

1 5 10 10 5 1

should be written as

1 5 A A 5 1

In this connection, in my inserted palindromic Pascal's triangle, the 6th row



should also be written as:

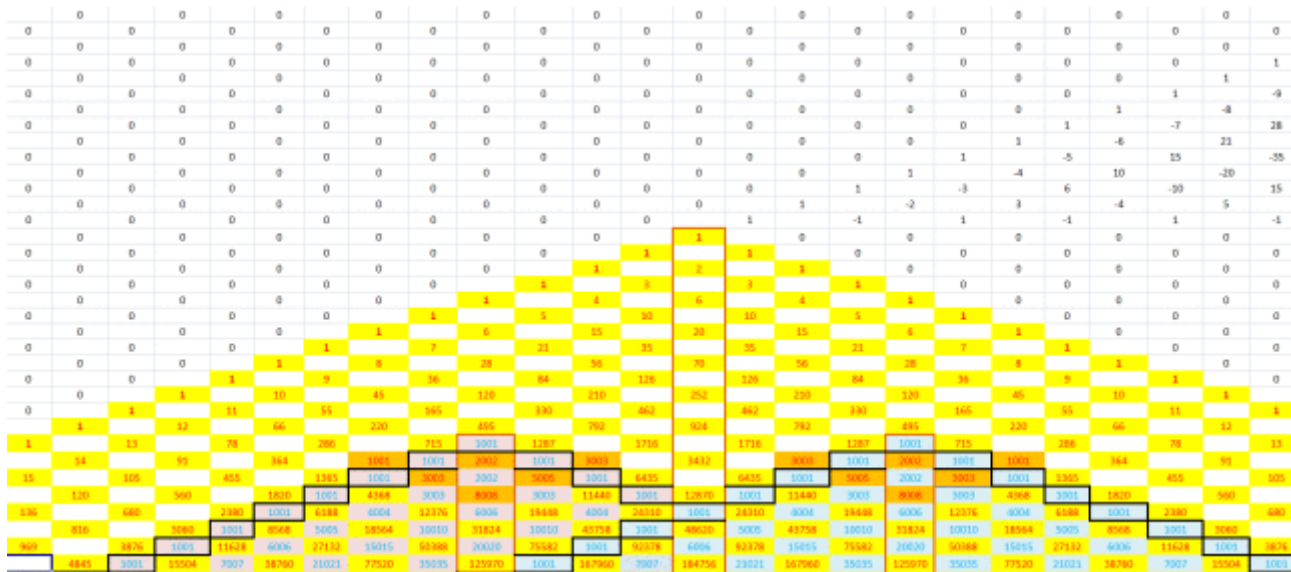
1001 5005 A0A A0A 5005 1001

Ergo, as in the original Pascal's triangle, the numbers in my inserted Pascal's triangle stay palindromic until infinity.

And if you look at the diagram below, you can see that my hidden Pascal's triangle exist on both sides of the original Pascal's triangle overlapping each other symmetrically. Furthermore, the whole diagram eerily forms a structure somewhat similar to the three (3) pyramids of Giza.



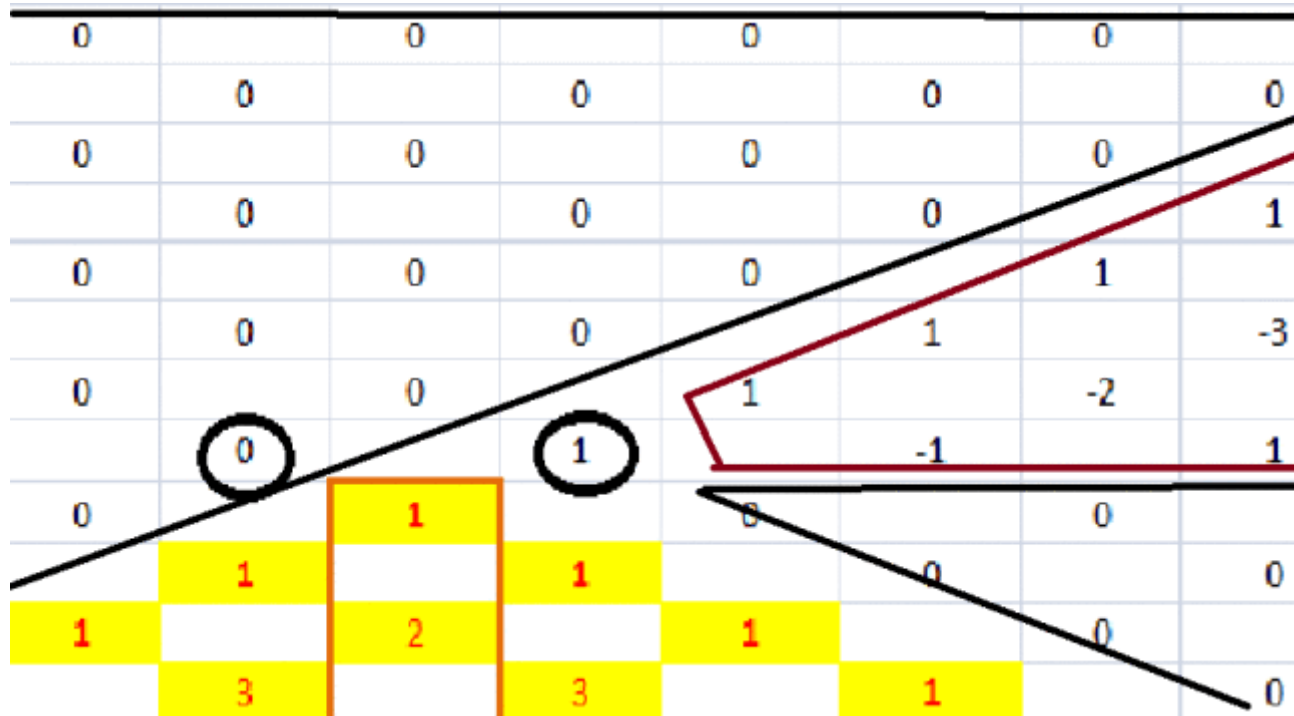
I also noticed that there are hidden numbers above the original Pascal's triangle as shown below.



Zooming in, the hidden numbers result from the existing numbers below them.

0		0		0		0	
	0		0		0		0
0		0		0		0	
	0		0		0		1
0		0		0		1	
	0		0		1		-3
0		0		1		-2	
	0		1		-1		1
0	0	1	0	0	0		
	1		1		0		0
1		2		1		0	
	3		3		1		0

For example, the apex number 1 in the original Pascal's triangle is, for me, made possible by the encircled zero (0) and one (1) above it. Although, the two encircled numbers could be reversed as 1 and 0 respectively. Doing so would also reverse the hidden numbers accordingly (makes me wonder if this has something to do with the probabilistic nature of our reality).



But what intrigues me more is what do the zeroes (enclosed in black lines) or what do the mirror numbers (enclosed in red lines) mean? Was the Pascal's triangle a representation of the nature of reality designed by a more advanced civilization that fathered the ancient Sumerians and the Egyptians then later discovered by Indian and Chinese mathematicians of lore long before Blaise Pascal? Can we say that the number 1 that stands at the apex of the Pascal's triangle symbolized the primordial particle of the Big Bang and that the numbers (hidden and otherwise) represent everything that were created afterwards.

Again, here are the mirror numbers expanded below:

0		0		0		0		0		0		0		0
	0		0		0		0		0		0		0	
0		0		0		0		0		0		0		0
	0		0		0		0		0		0		0	1
0		0		0		0		0		0		0	1	
	0		0		0		0		0		0	1	-9	
0		0		0		0		0		0	1	-8		
	0		0		0		0		0	1	-7	28		
0		0		0		0		0	1	-6	21			
	0		0		0		0	1	-5	15	-35			
0		0		0		0	1	-4	10	-20				
	0		0		0	1	-3	6	-10	15				
0		0		0	1	-2	3	-4	5					
	0		0	1	-1	1	-1	1	-1					
0		0	1	-1	0	0	0	0	0	0				
	0	1	-1	0	0	0	0	0	0	0	0			
1	0	2	0	1	0	0	0	0	0	0	0			

As of this writing, I'm still trying to figure out what these hidden numbers in the Pascal's triangle are all about. Please help me if you can.



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